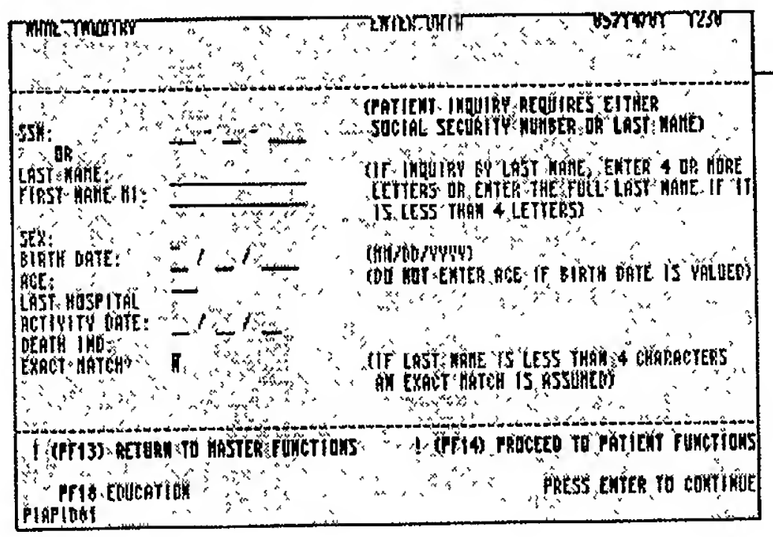
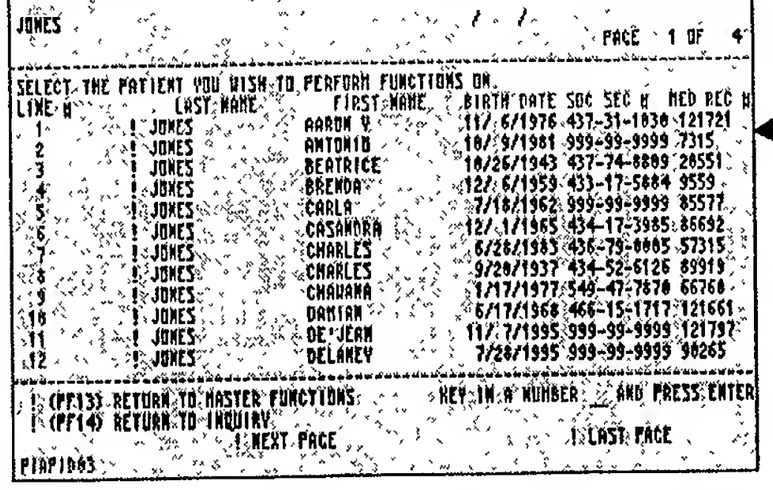
The Application User View	The Program Logic View	Typical Performance Collecting View

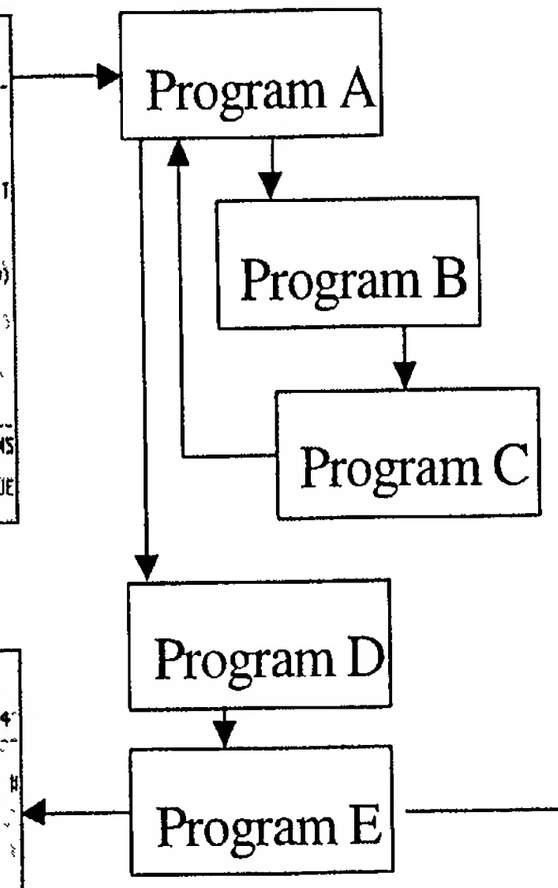
User invokes some function...



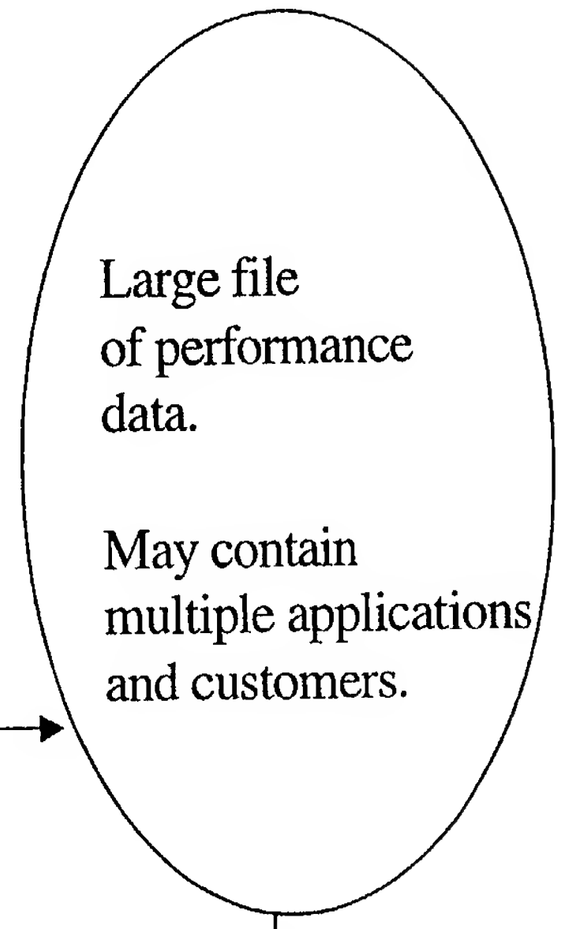
and gets a response.



Programs are invoked...



until logic is completed.
Performance data are saved.



Cost information needs to be summarized, analyzed and reported on...

Prior Art
Fig. 1

21 22 23

	Costing Data Size			
	Large	Medium	Small	
Max	45,000	20,000	10,000	
Min	15,000	11,000	3,000	
80 byte/hr	3,600,000	1,600,000	800,000	max. total
96 byte/hr	4,320,000	1,920,000	960,000	data size
160 byte/hr	7,200,000	3,200,000	1,600,000	per hr
80 byte/hr	28,800,000	12,800,000	6,400,000	max. total
96 byte/hr	34,560,000	15,360,000	7,680,000	data size
160 byte/hr	57,600,000	25,600,000	12,800,000	per 8 hrs
80 byte/hr	86,400,000	38,400,000	19,200,000	max. total
96 byte/hr	103,680,000	46,080,000	23,040,000	data size
160 byte/hr	172,800,000	76,800,000	38,400,000	per 24 hrs

24

Prior Art

Fig. 2

Notes:

1. large sample was not for a super large customer or entity
2. 80 bytes provided CPU statistic only
3. 96 bytes provided CPU, file, TS (temporary storage) etc. overviews
4. 160 bytes provided CPU and detailed fields
5. using all CMF fields would require 350+ bytes

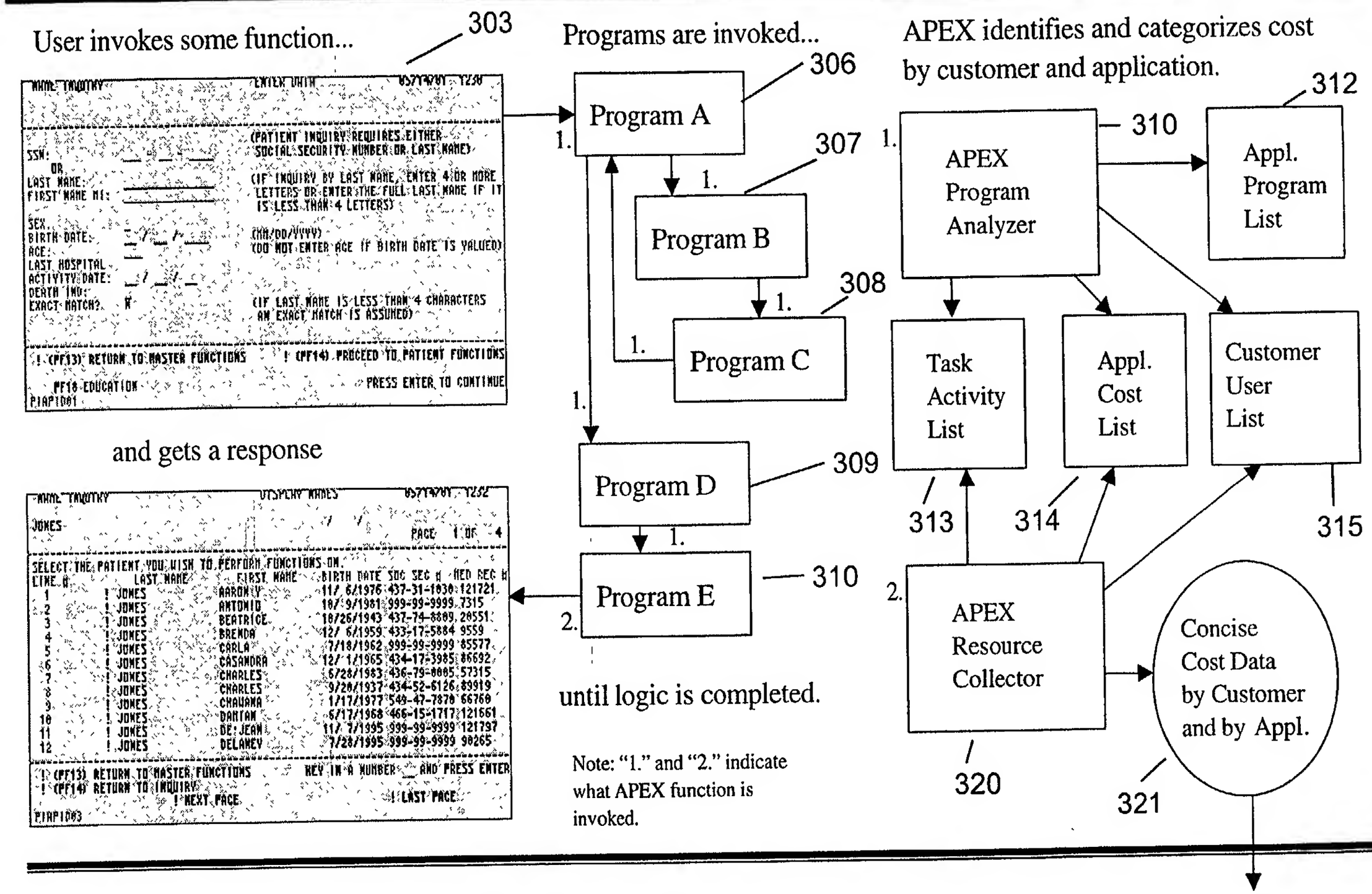


Fig. 3

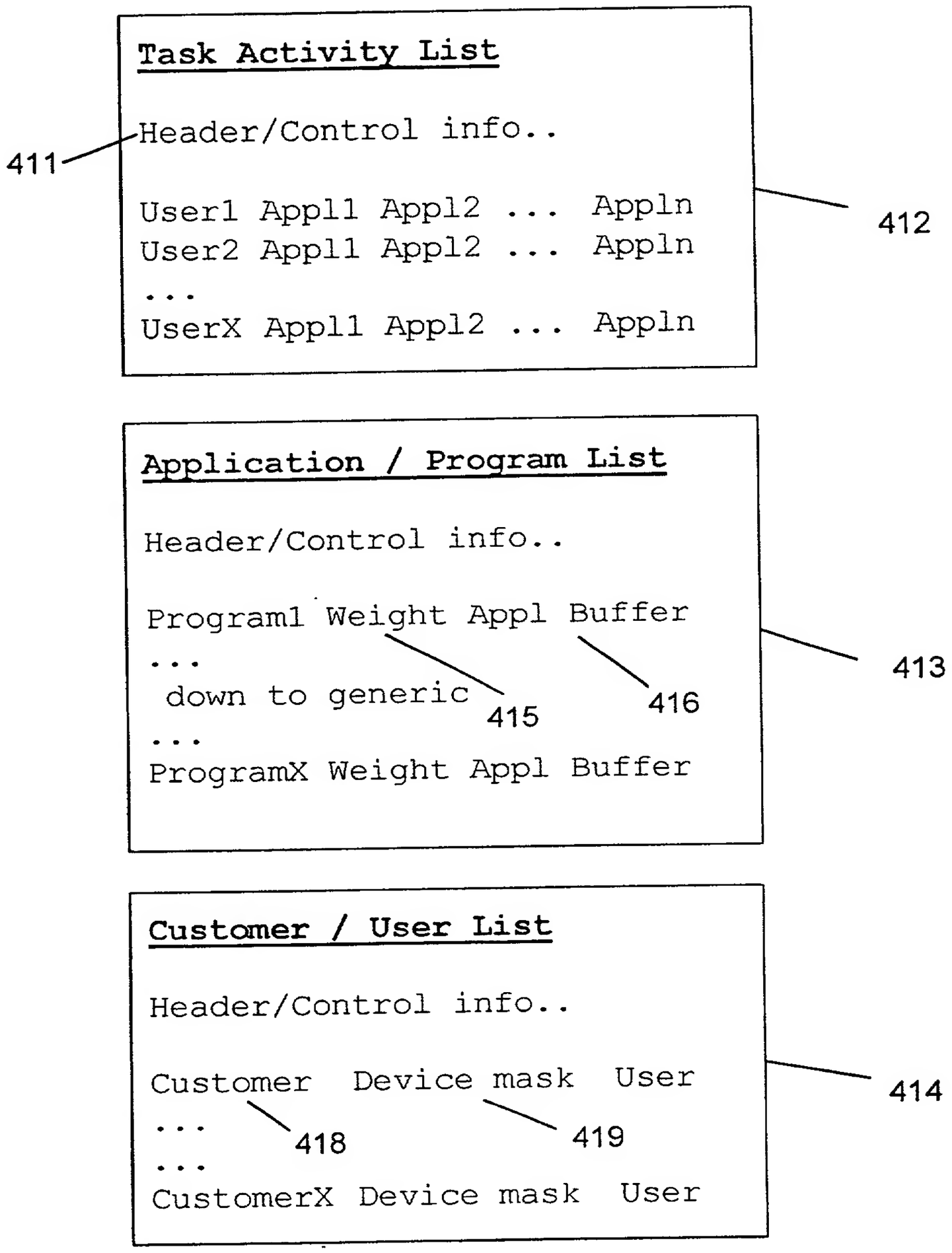

Task Activity List
Header/Control info..
User1 Appl1 Appl2 ... Appln
User2 Appl1 Appl2 ... Appln
...
UserX Appl1 Appl2 ... Appln
411
412
Application / Program List
Header/Control info..
Program1 Weight Appl Buffer
...
down to generic
415
416
...
ProgramX Weight Appl Buffer
413
Customer / User List
Header/Control info..
Customer Device mask User
...
418
419
...
CustomerX Device mask User
414

Fig. 4A

Application / Cost List

Header/Control info..

457	458	459
Cust1/Appl1	Criteria Stats	Performance Stats
Cust1/Appl2	Criteria Stats	Performance Stats
...		
Cust1/Appln	Criteria Stats	Performance Stats
...		
CustX/Appln	Criteria Stats	Performance Stats

451

Report Generation List

Links to statistics captured in the ACL.
Followed by reporting criteria (hourly, daily)
and the output mechanism (file, SMF etc..)

452

Application / Statistical Definition List

Maps specific statistical reporting criteria
to the actual data collection mechanism
provided by the online system.

453

Program Buffer Pool

Provides an MRU pooling construct to keep APL
list searching to a minimum. Has pointers to
the APL and TAL constructs.

454

Fig. 4B

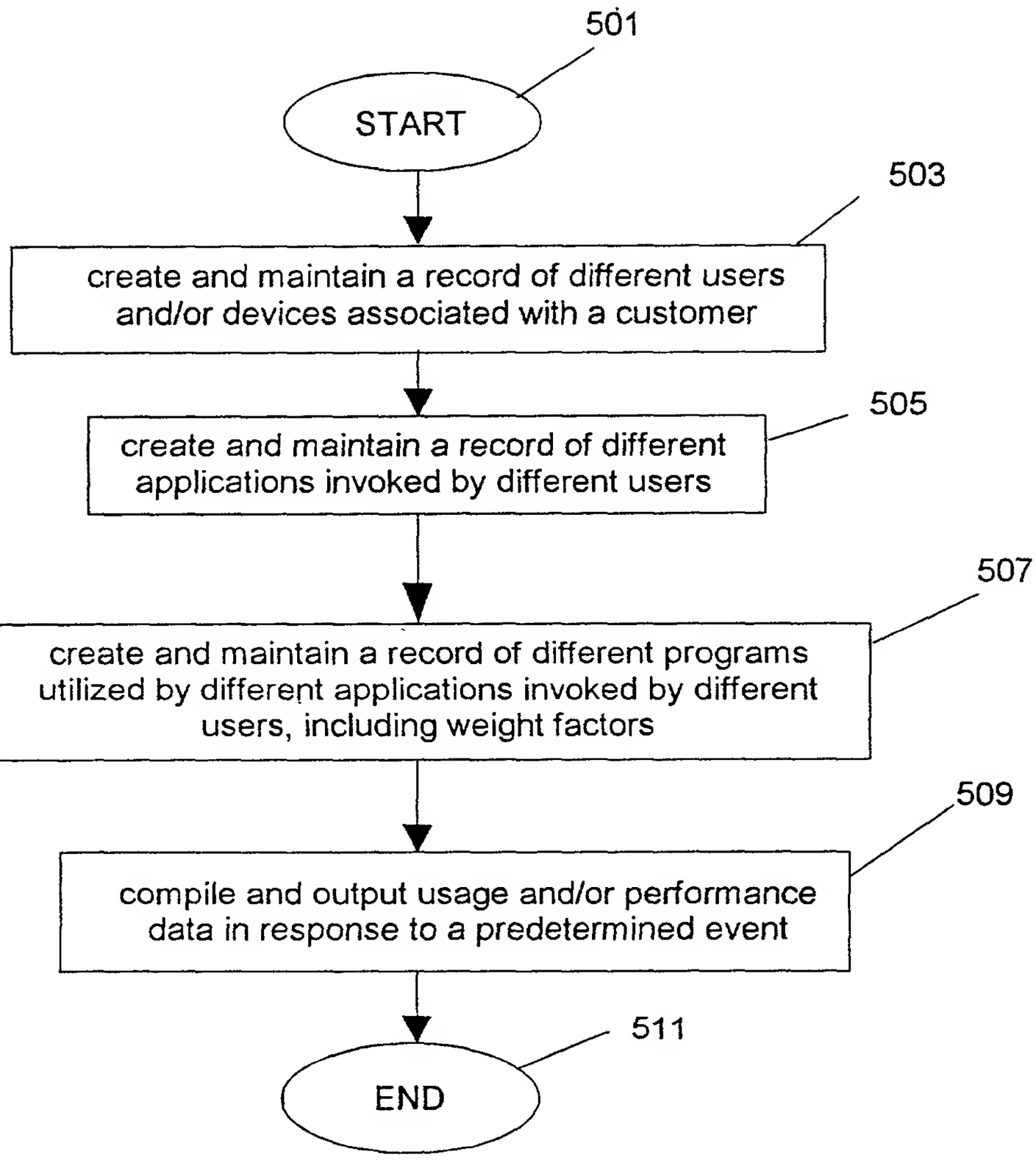

501
START
503
create and maintain a record of different users and/or devices associated with a customer
505
create and maintain a record of different applications invoked by different users
507
create and maintain a record of different programs utilized by different applications invoked by different users, including weight factors
509
compile and output usage and/or performance data in response to a predetermined event
511
END

Fig. 5A

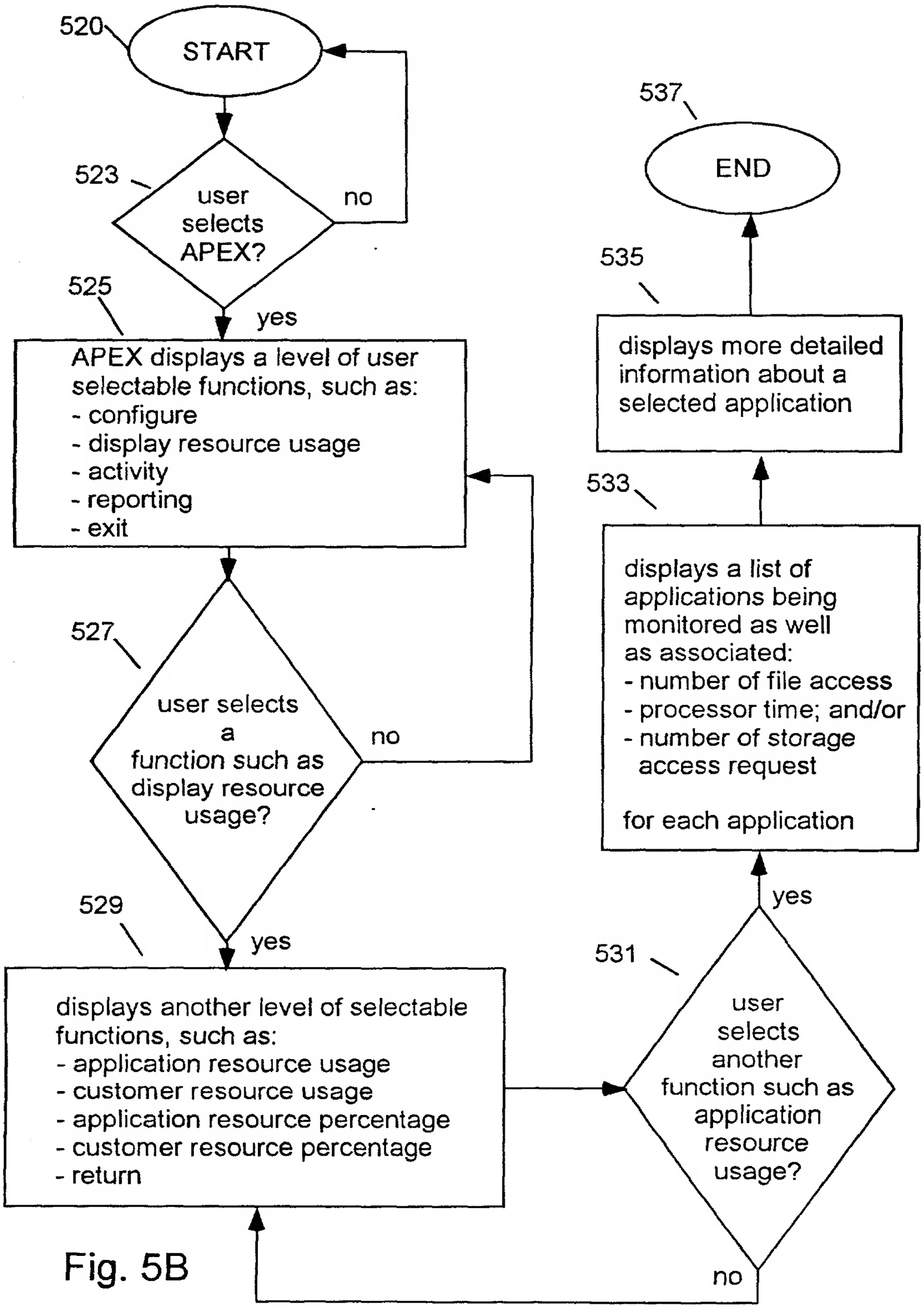

520
START
523
user selects APEX?
no
yes
525
APEX displays a level of user selectable functions, such as:
- configure
- display resource usage
- activity
- reporting
- exit
527
user selects a function such as display resource usage?
no
yes
529
displays another level of selectable functions, such as:
- application resource usage
- customer resource usage
- application resource percentage
- customer resource percentage
- return
531
user selects another function such as application resource usage?
no
yes
533
displays a list of applications being monitored as well as associated:
- number of file access
- processor time; and/or
- number of storage access request
for each application
535
displays more detailed information about a selected application
537
END

Fig. 5B

PATH : APEX
STATUS: ACTIVE SINCE 01127 00:54:46 CURRENT: 01131 14:38:36

1. CONFIGURE — 611
2. DISPLAY RESOURCE USAGE — 612
3. ACTIVITY — 613
4. REPORTING — 614
0. EXIT APEX — 615

SELECT AN OPTION: AND PRESS <ENTER>

<PF3>:EXIT

610

Fig. 6A

PATH : APEX\DISPLAY
STATUS: ACTIVE SINCE 01127 00:54:46 CURRENT: 01131 14:39:28

1. APPLICATION RESOURCE USAGE — 621
2. CUSTOMER RESOURCE USAGE — 622
3. APPLICATION RESOURCE PERCENTAGE — 623
4. CUSTOMER RESOURCE PERCENTAGE — 624
0. RETURN — 625

SELECT AN OPTION: AND PRESS <ENTER>

<PF3>:EXIT

620

Fig. 6B

```
PATH  : APEX\DISPLAY\APPLICATION_RESOURCE_USAGE
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:40:20

APPLICATION   TOTAL CPU TIME        TOTAL FILE REQUESTS   TOTAL TS REQUESTS
-------------------------------------------------------------------------
_  APS        00:00:00.00000                 0                    0
_  BNS        00:00:00.00000                 0                    0
_  CHT        00:00:00.00000                 0                    0
_  CIC        00:00:01.37152             3,595                5,213
_  CMA        00:00:00.00446                 7                    4
_  CMF        00:00:00.00000                 0                    0
_  CRM        00:00:00.22608             1,434                  305
_  CWS        00:00:00.01048                32                   11
_  GDI        00:00:00.09080               272                  106
_  GLS        00:00:00.00000                 0                    0
_  HRS        00:00:00.00000                 0                    0
_  IBS        00:00:00.00000                 0                    0
_  MML        00:00:01.70035             1,037                  951
_  MRS        00:00:00.04868               124                   16
_  NDB        00:00:00.01678                52                    4
_        MORE->
_  TOTALS     00:00:16.73848            69,482               18,750
-------------------------------------------------------------------------
    <PF3>:RETURN   <PF5>:VIEW %              <PF8>:DOWN   SELECT FOR DETAILS
```

631 632 633 634 637 630

Fig. 6C

```
PATH  : APEX\DISPLAY\APPLICATION_RESOURCE_BY_%
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:40:44

APPLICATION   TOTAL CPU TIME        TOTAL FILE REQUESTS   TOTAL TS REQUESTS
-------------------------------------------------------------------------
_  APS
_  BNS
_  CHT
_  CIC              08.15%                05.16%               27.69%
_  CMA              00.02%                00.01%               00.02%
_  CMF
_  CRM              01.34%                02.05%               01.62%
_  CWS              00.06%                00.04%               00.05%
_  GDI              00.54%                00.39%               00.56%
_  GLS
_  HRS
_  IBS
_  MML              10.14%                01.49%               05.07%
_  MRS              00.28%                00.17%               00.08%
_  NDB              00.09%                00.07%               00.02%
_        MORE->
_  TOTALS          100.00%               100.00%              100.00%
-------------------------------------------------------------------------
    <PF3>:RETURN   <PF5>:VIEW #              <PF8>:DOWN   SELECT FOR DETAILS
```

640

Fig. 6D

```
PATH  : APEX\DISPLAY\APPLICATION_RESOURCE_USAGE
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:41:40

HHRR CODE: L0NU                              APPLICATION:  CIC

STATISTIC                  VALUE          STATISTIC                  VALUE
-------------------------------------------------------------------------
TTL ALLOC REQ                3,663        MAX USER  STG USED       133,264
MAX USER  STG USED          53,632        MAX CDSA STG USED          5,664
MAX ECDSA STG USED           6,320        MAX PGM STG (TTL)        510,152
MAX 16M+ PGMSTG USED       404,496        MAX 16M- PGMSTG USED     118,936
FILE READ REQUESTS           2,010        FILE WRITE REQUESTS           90
FILE BROWSE REQUESTS           256        FILE ADD REQUESTS            745
FILE DELETE REQUESTS           188        TOTAL FILE REQUESTS        3,687
TOTAL FILE ACC.I/F           4,939        TOTAL TD REQUESTS          1,473
TS GET REQUESTS              3,036        TS-AUX PUT REQUESTS        2,210
TS-MAIN PUT REQUESTS             0        TOTAL TS REQUESTS          5,246
PROGRAM LINK REQ.            3,187        PROGRAM XCTL REQ.            109
JOURNAL OUTPUT REQ.            110        TTL DISP TIME     00:00:04.34664
TOTAL CPU TIME     00:00:01.40385         TTL SUSP TIME     00:00:55.66921
T TERM I/O WTIME   00:00:14.53320         TTL FI I/O WTIME  00:00:11.71616
TTL JC I/O WTIME   00:00:00.96356         TTL TS I/O WTIME  00:00:00.20697
-------------------------------------------------------------------------
                <PF3>:EXIT
```

651

652

650

Fig. 6E

```
PATH  : APEX\ACTIVITY
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:43:48
-------------------------------------------------------------------------


                    1. PROGRAM-APPLICATION MASK LIST

                    2. CURRENT TASK-ACTIVITY

                    3. LAST ACTIVE... (PGMS,TRNS,TSKS)

                    4. APPLICATION ACTIVITY STATISTICS

                    5. MISCELLANEOUS

                    0. RETURN


                SELECT AN OPTION:  3  AND PRESS <ENTER>
-------------------------------------------------------------------------
                <PF3>:EXIT
```

Fig. 7

```
PATH  : APEX\ACTIVITY\PROGRAM-APPLICATION_MASK_LIST
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:44:16

TOTAL REFERENCES :     3,486,617                              PAGE :  1

 PROGRAM / APPL      COUNT      WT        PROGRAM / APPL      COUNT      WT
-------------------------------------------------------------------------
 A2000PCL MRS        33,948    80        A2000PHP IBS            0    80
 A2000TCL NSS             0    80        A2000TMF IBS            0    80
 A2000TRV URS             0    80        GAHHRRSW PAS            0    80
 REPTSIGN SCH           170    80        SMS#NDBE NDB            0     1
 A2000L7* OPS             0    80        A2000M7* OPS            0    80
 A2000PX* RXS             0    80        A2000P7* OPS            0    80
 A2000TX* RXS             0    80        PETPARS* PET            0    80
 BCF***** CIC             0    80        CDO***** EAD            0    80
 CIX***** NDB         8,162     1        DFH***** CIC       41,377     1
 DRG***** CMA             0    80        GAA***** APS            0    80
 GAF***** PAM             0    80        GAH***** HRS            0    80
 GAX***** PAS             0    80        HDO***** EAD            0    80
 MAS***** PMS             0    80        NDB***** NDB      120,362     1
 OIO***** EAD             0    80        PDF***** OAS            0    10
 PFO***** PMS         1,253    80        PQO***** HRS            0    80
-------------------------------------------------------------------------
              <PF3>:EXIT                              <PF8>:DOWN
```

Fig. 8

```
PATH  : APEX\ACTIVITY\LAST_ACTIVE\PROGRAMS
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:44:45

LAST 100 REFERENCES
-------------------
 1-CHPPPG01   2-CHPPPG01   3-CHPPPG01   4-CHPPPG01   5-CHPPPG01   6-CHPPPG01
 7-CHPPPG01   8-CHPPPG01   9-PA201100  10-PA201400  11-CHPPPG01  12-CHPPPAGE
13-CHPPMAIN  14-CIACZDSL  15-CITMFATD  16-DFHZCQ    17-DFHZATD   18-CIMMROUT
19-CINEPRCO  20-CISISERV  21-CISISERV  22-CISISERV  23-CISISERV  24-CIGOJASU
25-CIXVSIGN  26-CINEPSMS  27-DFHZNEP   28-DFHSFP    29-CIFPLOGO  30-CHPPPG01
31-CHPPPAGE  32-CHPPPG01  33-CHPPPG01  34-CHPPPG01  35-NDBLDPC   36-CHPPAPID
37-CHPPMAIN  38-CISMSMAS  39-CIFPUCON  40-CHPPSIOF  41-CIMMROUT  42-CHPPXENQ
43-CHPPXENQ  44-CHPPSYLG  45-CIFPUCON  46-CHPPSYSO  47-CHPPSION  48-CHPPPG01
49-CHPPPG01  50-CHPPPG01  51-CHPPPG01  52-CHPPPG01  53-CHPPPG01  54-CHPPPG01
55-CHPPPG01  56-PA201100  57-PA201400  58-CHPPMAIN  59-CHPPSYCP  60-CHPPSYCP
61-CHPPPG01  62-CHPPPG01  63-CICSAUTH  64-CHPPCWAC  65-CHPPGTNN  66-PA200000
67-CICSAUTH  68-CHPPCWAC  69-CHPPGTNN  70-PA201900  71-CHPPMAIN  72-CHPPCCON
73-CHPPSYSO  74-CHPPSION  75-CHPPMAIN  76-CHPPMAIN  77-CHPPMAIN  78-CHPPPG01
79-CHPPPG01  80-CHPPPG01  81-CHPPPG01  82-CHPPPG01  83-CHPPPG01  84-CHPPPG01
85-CHPPPG01  86-PA201100  87-PA201400  88-CHPPMAIN  89-CHPPSYCP  90-CHPPMAIN
91-CHPPCCON  92-CHPPSION  93-CHPPMAIN  94-CIFPUCON  95-CHPPC001  96-CIMMROUT
97-CHPPXENQ  98-CHPPXENQ  99-CHPPSYLG 100-NDBLDPC
-------------------------------------------------------------------------
              <PF3>:EXIT          <PF5>:VIEW TASK/TRAN
```

Fig. 9

PATH : APEX\ACTIVITY\APPLICATION_ACTIVITY_STATISTICS
STATUS: ACTIVE SINCE 01127 00:54:46 CURRENT: 01131 14:45:06

RECS PROCSD/TOTAL: 383,008 / 387,452 CLOSE WEIGHT: 2

APPLICATION	TOTAL	SWEEP	CLOSE	APPLICATION	TOTAL	SWEEP	CLOSE
L0NU-APS	2,117	0	0	L0NU-BNS	0	0	0
L0NU-CHT	0	0	0	L0NU-CIC	76,015	0	1,946
L0NU-CMA	70	0	0	L0NU-CMF	0	0	0
L0NU-CRM	2,707	12	0	L0NU-CWS	377	377	377
L0NU-GDI	6,252	9	1	L0NU-GLS	806	166	1
L0NU-HRS	0	0	0	L0NU-IBS	0	0	0
L0NU-MML	19,205	5,693	1,384	L0NU-MRS	484	56	6
L0NU-NDB	118	7	78	L0NU-NSS	0	0	0
L0NU-OAS	148,644	4,092	67,794	L0NU-OPS	17,585	17,585	175
L0NU-PAM	0	0	0	L0NU-PAS	46,624	46,622	17,633
L0NU-PET	0	0	0	L0NU-PMS	59,484	59,477	1,789
L0NU-ROC	0	0	0	L0NU-RRS	0	0	0
L0NU-RSS	241	241	0	L0NU-RXS	2,051	2,051	1,182
L0NU-SCH	212	212	121	L0NU-URS	2	2	0
L0NU-EAD	0	0	0	L0NU-UKN	14	1	0

<PF3>:EXIT <PF5>:VIEW PATH LENGTH

Fig. 10

PATH : APEX\ACTIVITY\APPLICATION_ACTIVITY_STATISTICS
STATUS: ACTIVE SINCE 01127 00:54:46 CURRENT: 01131 14:45:33

RECS PROCSD/TOTAL: 383,052 / 387,496 CLOSE WEIGHT: 2

APPLICATION	AVG.	MIN.	MAX.	APPLICATION	AVG.	MIN.	MAX.
L0NU-APS	12.5	2	1,097	L0NU-BNS	0.0	0	0
L0NU-CHT	0.0	0	0	L0NU-CIC	3.3	1	1,870
L0NU-CMA	15.0	4	447	L0NU-CMF	0.0	0	0
L0NU-CRM	38.3	2	446	L0NU-CWS	5.0	4	7
L0NU-GDI	14.0	1	42	L0NU-GLS	19.9	2	240
L0NU-HRS	0.0	0	0	L0NU-IBS	0.0	0	0
L0NU-MML	7.6	1	218	L0NU-MRS	84.7	3	270
L0NU-NDB	33.4	1	758	L0NU-NSS	0.0	0	0
L0NU-OAS	20.7	1	2,928	L0NU-OPS	14.5	2	315
L0NU-PAM	0.0	0	0	L0NU-PAS	12.4	1	156
L0NU-PET	0.0	0	0	L0NU-PMS	13.8	1	3,165
L0NU-ROC	0.0	0	0	L0NU-RRS	0.0	0	0
L0NU-RSS	5.0	5	6	L0NU-RXS	7.2	2	42
L0NU-SCH	2.8	2	35	L0NU-URS	14.0	11	17
L0NU-EAD	0.0	0	0	L0NU-UKN	1.0	1	2

<PF3>:EXIT <PF5>:VIEW STATISTICS

Fig. 11

```
PATH  : APEX\ACTIVITY\MISCELLANEOUS
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:46:02
--------------------------------------------------------------------------------


                    1. BUFFER STATISTICS

                    *. MULTI-CLIENT ACTIVITY

                    0. RETURN


                  SELECT AN OPTION:     AND PRESS <ENTER>
--------------------------------------------------------------------------------
                <PF3>:EXIT
```

Fig. 12

```
PATH  : APEX\ACTIVITY\MISCELLANEOUS\BUFFER_STATISTICS
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:46:33

BUFFERS:              21    TTL HITS:    2,837,723   TTL ADDS:      650,544

HIT-PGM  RULEBASE  TTL-HITS  TTL-REFS   HIT-PGM  RULEBASE  TTL-HITS  TTL-REFS
--------------------------------------------------------------------------------
CHPPSYCP      MISC   485,333   730,621   CIACZDSM CI******   191,492   259,191
CHPPMAIN CHPPMAIN   234,559   239,925   PA201100 PA******    79,245   118,826
CHPPCCON      MISC   485,333   730,621   PA201400 PA******    79,245   118,826
CHPPSION      MISC   485,333   730,621   CICSAUTH CI******   191,492   259,191
CHPPPG01 CHPPPG01   301,420   307,381   PA201800 PA******    79,245   118,826
CHPPCWAC CHPPCWAC   215,365   220,529   PA200000 PA******    79,245   118,826
CHPPGTNN CHPPGTNN   104,494   114,022   CIFPUCOF CI******   191,492   259,191
CHPPPAGE CHPPPAGE    60,752    67,194   PA221700 PA******    79,245   118,826
CHPPCSUP      MISC   485,333   730,621   DFHGMM   DFH*****    18,519    41,438
CHPPTIME      MISC   485,333   730,621   CISISERV CI******   191,492   259,191
CHPPNNIM CHPPNNIM       400     3,829   CIFPUTSI CI******   191,492   259,191
CHPPNNEH CHPPNNEH       390     3,794   CIFPGMM  CI******   191,492   259,191
CHPPOP50 CHPPOP**    21,374    45,002   CIONCSAC CI******   191,492   259,191
CHPPOP10 CHPPOP**    21,374    45,002   CIXVSIGN CIX*****     3,688     8,176
CHPPXENQ CHPPXENQ   408,190   413,554   CIMMROUT CI******   191,492   259,191
--------------------------------------------------------------------------------
                <PF3>:EXIT
```

Fig. 13

```
PATH  : APEX\REPORTING
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 14:54:22
-------------------------------------------------------------------------------


                    1. REPORT SETUP

                    2. REPORT STATUS ACTIVITY  ─── 1402

                    *. HIST. SAMPLE STATUS

                    *. CREATE HIST. SAMPLE

                    0. RETURN



                SELECT AN OPTION:  _  AND PRESS <ENTER>
-------------------------------------------------------------------------------
                <PF3>:EXIT
```

1401

Fig. 14

```
PATH  : APEX\REPORT\REPORT_STATUS_ACTIVITY
STATUS: ACTIVE SINCE 01127 00:54:46    CURRENT:  01131 15:00:48

                        REPORT STATUS ACTIVITY
-------------------------------------------------------------------------------

        INITIAL REPORT PRODUCED:  01127 00:58:01  ─── 1502

        LATEST  REPORT PRODUCED:  01131 14:58:21  ─── 1503


        TOTAL REPORTS REQUESTED:            3,330

        TOTAL REPORTS GENERATED:            3,330

        TOTAL REPORTS IN ERROR :                0


-------------------------------------------------------------------------------
                <PF3>:EXIT
```

1501

Fig. 15